

## CLAIMS

1. A method of forming a floating charge pump  
5 comprising:

referencing an output capacitor of the floating charge pump to a high side voltage.

2. The method of claim 1 wherein referencing the  
10 output capacitor of the floating charge pump to the high side voltage includes coupling one terminal of the output capacitor to receive the high side voltage and coupling a second terminal of the output capacitor to receive a pump voltage of the floating charge pump.

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3. The method of claim 1 wherein referencing the output capacitor of the floating charge pump to the high side voltage includes coupling the output capacitor to charge to a voltage substantially equal to a pump voltage  
20 of the floating charge pump.

4. The method of claim 1 further including coupling a pump capacitor to charge to a voltage substantially equal to the high side voltage plus a pump voltage of the  
25 floating charge pump.

5. The method of claim 1 further including forming a charge pump controller operably coupled to generate a pump voltage of the floating charge pump and generate a series  
30 of pulses having a voltage swing equal to the pump voltage.

6. The method of claim 5 wherein forming the charge pump controller operably coupled to generate the pump voltage includes coupling the charge pump controller to generate a regulated voltage and to couple the regulated  
5 voltage to an output of the charge pump controller to generate the pump voltage.

7. The method of claim 1 further including coupling the floating charge pump to disable charging the output  
10 capacitor when a pump voltage of the floating charge pump exceeds a protection value.

8. A floating charge pump circuit comprising:  
an first input coupled to receive an input voltage;  
and  
an output capacitor referenced to the input voltage.

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9. The floating charge pump circuit of claim 8  
wherein the output capacitor referenced to the input  
voltage includes the output capacitor operably coupled to  
charge to a voltage substantially equal to a pump voltage  
10 of the floating charge pump circuit.

10. The floating charge pump circuit of claim 8  
wherein the output capacitor referenced to the input  
voltage includes a first terminal of the output capacitor  
15 referenced to the input voltage and a second terminal  
coupled to receive a pump voltage of the floating charge  
pump circuit.

11. The floating charge pump circuit of claim 8  
20 further including a charge pump capacitor coupled to  
receive a pump voltage of the floating charge pump circuit  
and to receive the input voltage, the charge pump  
capacitor having a first terminal and a second terminal.

25 12. The floating charge pump circuit of claim 11  
further including a first diode coupled to the first  
terminal of the charge pump capacitor and coupled to  
receive the input voltage.

30 13. The floating charge pump circuit of claim 11  
further including the output capacitor having a first  
terminal coupled to receive the input voltage and a second  
terminal coupled to a second diode, the second diode  
coupled to the first terminal of the charge pump  
35 capacitor.

14. The floating charge pump circuit of claim 8 further including a charge pump controller coupled to receive the input voltage and responsively form a pump voltage of the floating charge pump circuit.

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15. The floating charge pump circuit of claim 14 wherein the charge pump controller is operably coupled to disable charging the output capacitor when a pump voltage of the floating charge pump circuit exceeds a protection value.

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16. A method of forming a charge pump controller comprising:

forming a first input operable for receiving a feedback signal representative of an internal regulated voltage of the charge pump controller; and

coupling the charge pump controller to disable generating a charge pump signal when the internal regulated voltage exceeds a protection value of the charge pump controller.

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17. The method of claim 16 wherein forming a first input operable for receiving a feedback signal representative of an internal regulated voltage of the charge pump controller includes coupling a voltage regulator to form the internal regulated voltage including coupling the voltage regulator to receive a reference voltage.

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18. The method of claim 17 further including coupling a comparator to receive the reference voltage and disable generating the charge pump signal when the feedback signal exceeds the reference voltage by a first value.

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19. The method of claim 17 further including coupling an amplifier to receive the reference voltage and the feedback signal and responsively drive a regulator transistor to generate the internal regulated voltage.